

REMARKS/ARGUMENTS

Favorable reconsideration of this application as currently amended and in view of the following remarks is respectfully requested.

Claims 1, 2, 5-8, 10, and 12-18 are currently active in this case. Claims 1, 5, 7, 10, 12, 13, and 15 have been amended, and claims 3, 4, 9, 11, and 19 have been cancelled by the current amendment. Independent claims 1, 10, and 15 have been amended to include many of the limitations of original claims 4, 11, and 20, respectively. No new matter has been added.

In the outstanding office action, claims 1, 10, and 15 were objected to; claims 1, 2, 10, 15, and 18 were rejected as anticipated by Tanabe; claims 7 and 9 were rejected as anticipated by Wei Shi; claims 3 and 19 were rejected as being unpatentable over Tanabe in view of USP 5,457,707 to Sobey; claims 4-6, and 20 were rejected as being unpatentable over Tanabe in view of Furusawa; claim 8 was rejected as being unpatentable over Wei Shi in view of Furusawa; claims 11-13 were rejected as being unpatentable over Tanabe in view of JP Pub. 2002-287190; claim 14 was rejected as being unpatentable over Tanabe; claim 16 was rejected as being unpatentable over Tanabe in view of USPG Pub 2005-0134847 to Hebert; and claim 17 was rejected as being unpatentable over Tanabe in view of USP 5,566,197 to Nilsson in view of USPG Pub 2004/0061055 to Kawase.

In response to the objection to the independent claims, those claims have been amended as recommended in the official action. No further objection to the claims is therefore anticipated.

Briefly recapitulating, the present invention (claims 1, 10 and 15, as amended) is directed to an electromagnetic wave generator including a first pump beam emitter including a first pump source implemented by one of a Cr-doped forsterite laser and an ytterbium-doped yttrium-lithium-fluoride laser, configured to emit a first pump beam having a

wavelength larger than one micrometer; and a second pump beam emitter including a second pump source implemented by one of a Cr-doped forsterite laser and an ytterbium-doped yttrium-lithium-fluoride laser, configured to emit a wavelength-tunable second pump beam having a wavelength larger than one micrometer, the wavelength of which is different from the wavelength of the first pump beam.

As a consequence of this configuration, it is possible to miniaturize the size of the electromagnetic wave generator to less than one meter. This is because the efficiency of the electromagnetic wave generator implemented by Cr-doped forsterite laser is high, and the output power of the YAG laser can be as low as 100mJ per pulse as the Cr-doped forsterite laser is excited by the fundamental wave of the YAG laser.

Turning now to Tanabe, there is no disclosure or suggestion of a first pump beam emitter including a first pump source implemented by one of a Cr-doped forsterite laser and an ytterbium-doped yttrium-lithium-fluoride laser and a second pump beam emitter including a second pump source implemented by one of a Cr-doped forsterite laser and an ytterbium-doped yttrium-lithium-fluoride laser.

In the optical parametric oscillator (OPO) architecture disclosed by Tanabe, because the OPO is excited by the third-harmonic wave of the YAG laser, the efficiency is low, and a high power YAG laser that emits 1000mJ per pulse is required. Therefore the size of OPO system becomes extremely large (e.g., larger than three meters). The reason why the third-harmonic wave of the YAG laser is employed in the OPO architecture is that the spectrum width of OPO reaches several hundred GHz due to the degenerated parametric output, if the OPO is excited by the second-harmonic wave of the YAG laser, and it becomes extremely disadvantageous for terahertz spectroscopy.

In view of the present amendment and foregoing arguments, the rejection of Claims 1, 10 and 15 under 35 U.S.C. §102(b) as being anticipated by Tanabe is respectfully requested to be withdrawn.

The official action acknowledges that Tanabe does not teach the features of original claim 4. However, the official action further asserts that Furusawa remedies the deficiencies of Tanabe. In response, Applicants respectfully point out that, although Furusawa discloses an ytterbium-doped fiber laser, Furusawa fails to teach or suggest a first pump beam emitter including a first pump source implemented by one of Cr-doped forsterite laser and an ytterbium-doped yttrium-lithium-fluoride laser and a second pump beam emitter including a second pump source implemented by one of a Cr-doped forsterite laser and an ytterbium-doped yttrium-lithium-fluoride laser. Thus, the combination of Furusawa and Tanabe does not cure the deficiencies in Tanabe.

Claims 2, 5, 6, 12, 13, 14, 16, 17, 18 are believed to be allowable for at least the same reasons that their respective independent claims are believed to be allowable.

Claim 7 has been rewritten so as to include the limitation of the original claim 9. Turning now to Wei Shi, there is no disclosure or suggestion of a nonlinear optical crystal including one of a GaP crystal and a ZnGeP₂ crystal configured to generate an electromagnetic wave of a difference frequency between the first and second pump beams. The GaSe crystal disclosed in Wei Shi et al is very difficult to handle because the layered crystal of GaSe is easily peeled off like mica due to the nature of the layered semiconductor structure. Therefore, the structure of Wei Shi is substantially different from the structure of claim 7 and cannot achieve the effectiveness of the structure of claim 7 which has a high practicality and utility.

Thus, in view of the present amendment and the foregoing remarks, the rejection of Claim 7 under 35 U.S.C. §102(b) as being anticipated by Wei Shi is respectfully requested to be withdrawn. Claim 8 is believed to be allowable for at least the same reasons as claim 7.

As no further issues are believed to remain, an early and favorable action is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Bradley D. Lytle
Attorney of Record
Registration No. 40,073

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)

W. Todd Baker
Registration No. 45,265